

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Amelia Walker Examiner #: 75663 Date: 5/5/04
 Art Unit: 1752 Phone Number 30 21331 Serial Number: 11/609509
 Mail Box and Bldg/Room Location: REM 9004 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Bib Sheet Attached

Inventors (please provide full names): _____

Earliest Priority Filing Date: _____

For Sequence Searches Only Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

Please search for a photograph composition comprising the members
 of claim 7 attached

(NOT MUCH ART INVOLVING THE TIMD FEATURE.)

STAFF USE ONLY

Type of Search

Vendors and cost where applicable

Searcher: EA NA Sequence (#) _____ STN \$ 362.49
 Searcher Phone #: _____ AA Sequence (#) _____ Dialog _____
 Searcher Location: _____ Structure (#) (2) (subset) Questel/Orbit _____
 Date Searcher Picked Up: _____ Bibliographic (and) Dr. Link _____
 Date Completed: 5-12-04 Litigation _____ Lexis/Nexis _____
 Searcher Prep & Review Time: 5 Fulltext _____ Sequence Systems _____
 Clerical Prep Time: _____ Patent Family _____ WWW/Internet _____
 Online Time: 90 Other _____ Other (specify) _____

=> file reg

FILE 'REGISTRY' ENTERED AT 18:48:31 ON 12 MAY 2004
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=> d his

L1 FILE 'LREGISTRY' ENTERED AT 17:34:53 ON 12 MAY 2004
STR

L2 FILE 'REGISTRY' ENTERED AT 17:49:45 ON 12 MAY 2004
SCR 2043
L3 13 S L1 AND L2

L4 FILE 'HCAPLUS' ENTERED AT 17:53:29 ON 12 MAY 2004
4317 S LEE G?/AU
L5 161361 S PHOTORESIST? OR RESIST OR RESISTS OR PHOTOMASK? OR MASK
L6 142 S L4 AND L5
L7 1 S TIMD
L8 0 S L4 AND L7

L9 FILE 'REGISTRY' ENTERED AT 17:54:02 ON 12 MAY 2004
E TETRAISOPROPYL METHYLENEDIPHOSPHONATE/CN
1 S E3

L10 FILE 'HCAPLUS' ENTERED AT 17:55:27 ON 12 MAY 2004
129 S L9
L11 0 S L4 AND L10
L12 44186 S ?PHOSPHONAT?
L13 0 S L6 AND L12

L14 FILE 'LREGISTRY' ENTERED AT 17:58:55 ON 12 MAY 2004
STR L1

L15 FILE 'REGISTRY' ENTERED AT 18:00:26 ON 12 MAY 2004
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L16 1 S L3 NOT L15
L17 298 S L14 AND L2 FUL
SAV L17 WAL509/A

L18 FILE 'LREGISTRY' ENTERED AT 18:02:00 ON 12 MAY 2004
STR L14

L19 FILE 'REGISTRY' ENTERED AT 18:02:32 ON 12 MAY 2004
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L20 15 S L18 SSS FUL SUB=L17
SAV L20 WAL509A/A
L21 283 S L17 NOT L20

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L23 153 S L21
L24 8 S L22 AND L5
L25 0 S L22 AND (L7 OR L10)
L26 152 S L23 AND L5
L27 0 S L23 AND (L7 OR L10)

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L30 91 S L29
L31 90 S L30 AND L5
L32 90 S L31 AND (1907-2003/PY OR 1907-2003/PRY)

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L33 5 S L28 NOT 1<NC
SEL L33 5 RN
L34 1 S E1

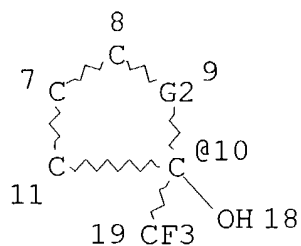
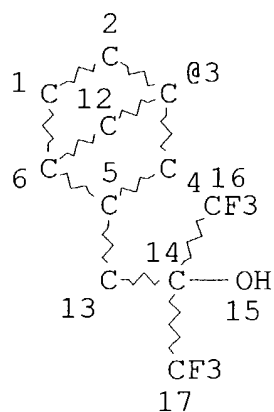
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L35 31 S L34
L36 31 S L35 AND L5
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L38 8 S L37 OR L24
L39 27 S L36 NOT L38
L40 27 S L39 AND (1907-2003/PY OR 1907-2003/PRY)
L41 0 S (L7 OR L10) AND L5

FILE 'REGISTRY' ENTERED AT 18:48:31 ON 12 MAY 2004

=> d l20 que stat

L2 SCR 2043
L14 STR

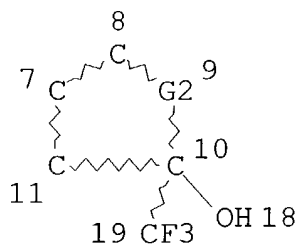


G3 24

REP G2=(1-2) C
 VAR G3=3/10
 NODE ATTRIBUTES:
 DEFAULT MLEVEL IS ATOM
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
 RING(S) ARE ISOLATED OR EMBEDDED
 NUMBER OF NODES IS 20

STEREO ATTRIBUTES: NONE
 L17 298 SEA FILE=REGISTRY SSS FUL L14 AND L2
 L18 STR



REP G2=(1-2) C
 NODE ATTRIBUTES:
 DEFAULT MLEVEL IS ATOM
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
 RING(S) ARE ISOLATED OR EMBEDDED
 NUMBER OF NODES IS 7

STEREO ATTRIBUTES: NONE
 L20 15 SEA FILE=REGISTRY SUB=L17 SSS FUL L18

100.0% PROCESSED 21 ITERATIONS
SEARCH TIME: 00.00.01

15 ANSWERS

=> file hcaplus

FILE 'HCAPLUS' ENTERED AT 18:48:53 ON 12 MAY 2004

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=> d l38 1-8 cbib abs hitstr hitind

L38 ANSWER 1 OF 8 HCAPLUS COPYRIGHT 2004 ACS on STN

2004:180145 Document No. 140:225800 Chemically amplified

photoresists and method for pattern formation. Harada,

Yuji; Hatakeyama, Jun; Kawai, Yoshio; Sasako, Masaru; Endo,

Masataka; Kishimura, Shinji; Maeda, Kazuhiko; Otani, Michitaka;

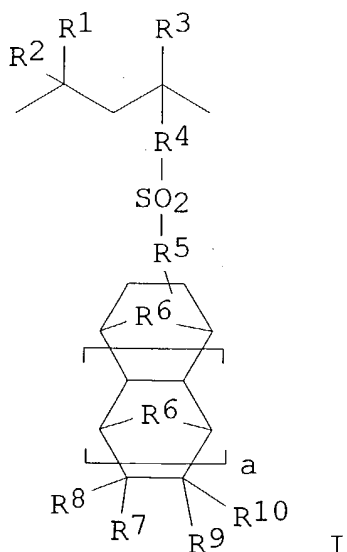
Komoritani, Haruhiko (Shin-Etsu Chemical Industry Co., Ltd., Japan;

Matsushita Electric Industrial Co., Ltd.; Central Glass Co., Ltd.).

Jpn. Kokai Tokkyo Koho JP 2004067972 A2 20040304, 41 pp.

(Japanese). CODEN: JKXXAF. APPLICATION: JP 2002-233045 20020809.

GI



AB The **photoresists** contain polymers of Mw 1000-500,000 having repeating units I [R1-R3 = H, F, (fluorinated) C1-40 alkyl; R4 = single bond, (fluorinated) C1-40 alkylene; R5 = single bond, O, (fluorinated) C1-40 alkylene; R6 = methylene, O, S; R7-R10 = H, F, fluorinated C1-4 alkyl, R11OR12, R11CO2R12, OR12; R11 = single bond, (fluorinated) C1-40 alkylene; R12 = H, acid-labile group; a = 0, 1]. The **photoresists** are patternwise exposed to 100-180-nm or 1-30-nm high-energy beams (e.g., F2 laser beams, Ar2 laser beams, soft x rays) and developed (after post-exposure baking).

IT 666258-16-8P 666258-18-0P 666258-19-1P
666258-20-4P 666258-21-5P 666258-22-6P
666258-24-8P

(chem. amplified pos. **photoresists** showing high sensitivity to high-energy beams)

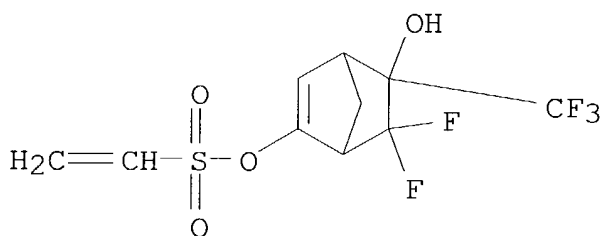
RN 666258-16-8 HCAPLUS

CN 2-Propenoic acid, 2-(trifluoromethyl)-, 1,1-dimethylethyl ester, polymer with α,α -bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and 6,6-difluoro-5-hydroxy-5-(trifluoromethyl)bicyclo[2.2.1]hept-2-en-2-yl ethenesulfonate (9CI) (CA INDEX NAME)

CM 1

CRN 666258-15-7

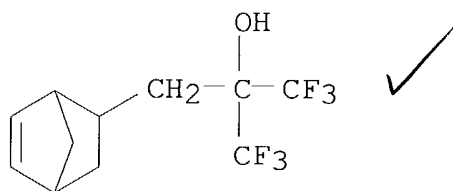
CMF C10 H9 F5 O4 S



CM 2

CRN 196314-61-1

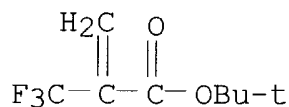
CMF C11 H12 F6 O



CM 3

CRN 105935-24-8

CMF C8 H11 F3 O2



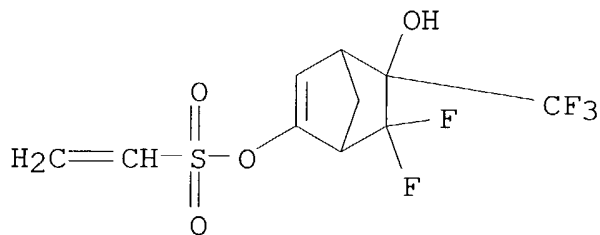
RN 666258-18-0 HCAPLUS

CN 2-Propenoic acid, 2-(trifluoromethyl)-, 2-methyltricyclo[3.3.1.1^{3,7}]dec-2-yl ester, polymer with α,α -bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and 6,6-difluoro-5-hydroxy-5-(trifluoromethyl)bicyclo[2.2.1]hept-2-en-2-yl ethenesulfonate (9CI) (CA INDEX NAME)

CM 1

CRN 666258-15-7

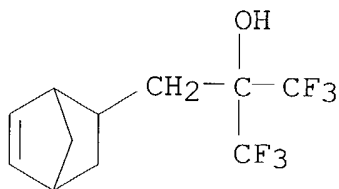
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CM 2

CRN 196314-61-1

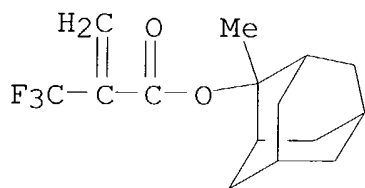
CMF C11 H12 F6 O



CM 3

CRN 188739-86-8

CMF C15 H19 F3 O2



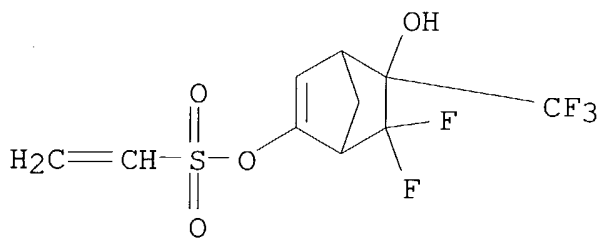
RN 666258-19-1 HCAPLUS

CN 2-Propenoic acid, 2-(trifluoromethyl)-, 1,1-dimethylethyl ester,
 polymer with 6,6-difluoro-5-hydroxy-5-(trifluoromethyl)bicyclo[2.2.1]
]hept-2-en-2-yl ethenesulfonate and 4-ethenyl- α,α -
 bis(trifluoromethyl)benzenemethanol (9CI) (CA INDEX NAME)

CM 1

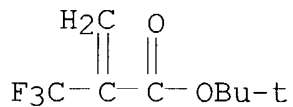
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CMF C10 H9 F5 O4 S



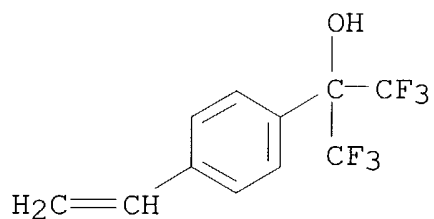
CM 2

CRN 105935-24-8
CMF C8 H11 F3 O2



CM 3

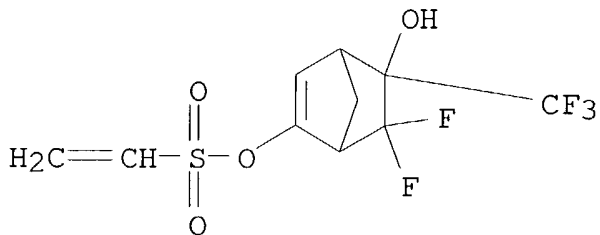
CRN 2386-82-5
CMF C11 H8 F6 O



RN 666258-20-4 HCAPLUS
CN 2-Propenoic acid, 2-(trifluoromethyl)-, 2-methyltricyclo[3.3.1.1^{3,7}]dec-2-yl ester, polymer with 6,6-difluoro-5-hydroxy-5-(trifluoromethyl)bicyclo[2.2.1]hept-2-en-2-yl ethenesulfonate and 4-ethenyl- α,α -bis(trifluoromethyl)benzenemethanol (9CI) (CA INDEX NAME)

CM 1

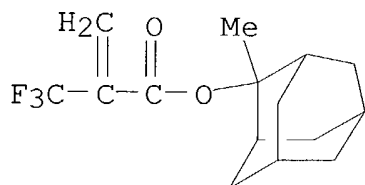
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CMF C10 H9 F5 O4 S



CM 2

CRN 188739-86-8

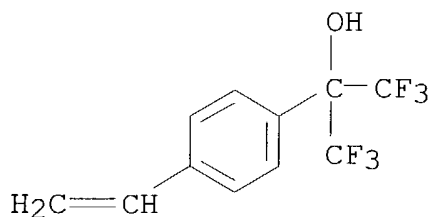
CMF C15 H19 F3 O2



CM 3

CRN 2386-82-5

CMF C11 H8 F6 O



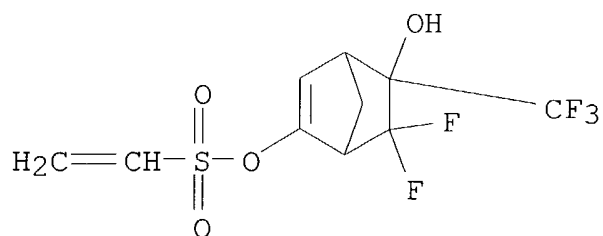
RN 666258-21-5 HCAPLUS

CN 2-Propenoic acid, 2-(trifluoromethyl)-, 1,1-dimethylethyl ester, polymer with 6,6-difluoro-5-hydroxy-5-(trifluoromethyl)bicyclo[2.2.1]hept-2-en-2-yl ethenesulfonate and 5-ethenyl- $\alpha,\alpha,\alpha',\alpha'$ -tetrakis(trifluoromethyl)-1,3-benzenedimethanol (9CI) (CA INDEX NAME)

CM 1

CRN 666258-15-7

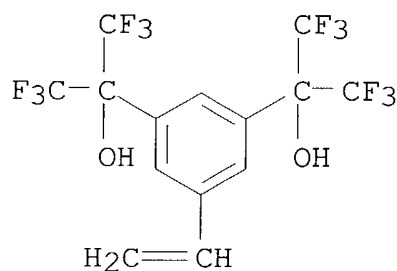
CMF C10 H9 F5 O4 S



CM 2

CRN 568587-26-8

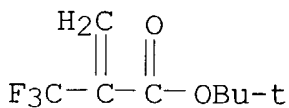
CMF C14 H8 F12 O2



CM 3

CRN 105935-24-8

CMF C8 H11 F3 O2

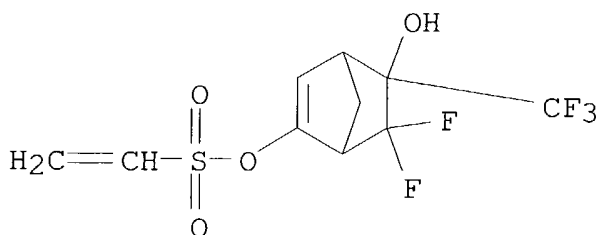


RN 666258-22-6 HCAPLUS

CN 2-Propenoic acid, 2-(trifluoromethyl)-, 2-methyltricyclo[3.3.1.1^{3,7}]dec-2-yl ester, polymer with 6,6-difluoro-5-hydroxy-5-(trifluoromethyl)bicyclo[2.2.1]hept-2-en-2-yl ethenesulfonate and 5-ethenyl- $\alpha,\alpha,\alpha',\alpha'$ -tetrakis(trifluoromethyl)-1,3-benzenedimethanol (9CI) (CA INDEX NAME)

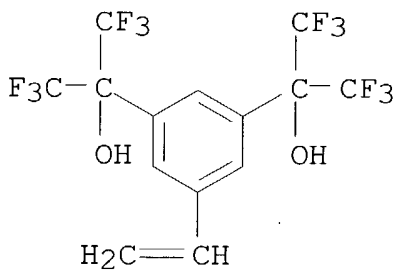
CM 1

CRN 666258-15-7
CMF C10 H9 F5 O4 S



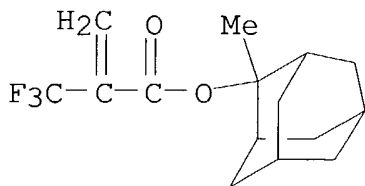
CM 2

CRN 568587-26-8
CMF C14 H8 F12 O2



CM 3

CRN 188739-86-8
CMF C15 H19 F3 O2



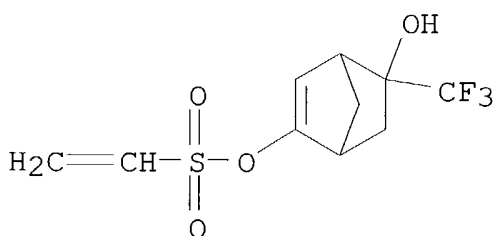
RN 666258-24-8 HCAPLUS
CN 2-Propenoic acid, 2-(trifluoromethyl)-, 1,1-dimethylethyl ester,

polymer with 5-ethenyl- $\alpha, \alpha, \alpha', \alpha'$ -
tetrakis(trifluoromethyl)-1,3-benzenedimethanol and
5-hydroxy-5-(trifluoromethyl)bicyclo[2.2.1]hept-2-en-2-yl
ethenesulfonate (9CI) (CA INDEX NAME)

CM 1

CRN 666258-23-7

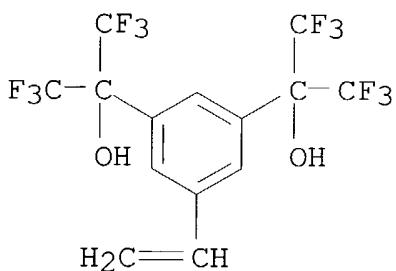
CMF C10 H11 F3 O4 S



CM 2

CRN 568587-26-8

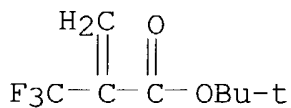
CMF C14 H8 F12 O2



CM 3

CRN 105935-24-8

CMF C8 H11 F3 O2



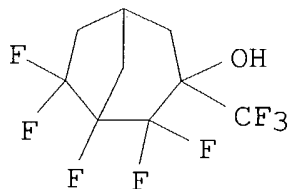
- IC ICM C08F028-02
ICS C08F212-14; C08F220-22; C08F232-00; G03F007-039; H01L021-027
- CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 38
- ST chem amplified pos **photoresist** vinylsulfonate
fluoropolymer; pattern formation pos **photoresist** chem
amplified
- IT Photolithography
Positive **photoresists**
(UV; chem. amplified pos. **photoresists** showing high
sensitivity to high-energy beams)
- IT Fluoropolymers, preparation
(chem. amplified pos. **photoresists** showing high
sensitivity to high-energy beams)
- IT X-ray **resists**
(pos.-working, soft x ray; chem. amplified pos.
photoresists showing high sensitivity to high-energy
beams)
- IT X-ray lithography
(soft x ray; chem. amplified pos. **photoresists** showing
high sensitivity to high-energy beams)
- IT 666258-16-8P 666258-18-0P 666258-19-1P
666258-20-4P 666258-21-5P 666258-22-6P
666258-24-8P 666258-26-0P
(chem. amplified pos. **photoresists** showing high
sensitivity to high-energy beams)
- L38 ANSWER 2 OF 8 HCAPLUS COPYRIGHT 2004 ACS on STN
2003:1007889 Document No. 140:50326 Positive **resist**
composition containing specific multi functional epoxy compound for
F2 excimer laser lithography. Toishi, Kouji; Miya, Yoshiko; Uetani,
Yasunori (Japan). U.S. Pat. Appl. Publ. US 2003236351 A1 20031225,
20 pp. (English). CODEN: USXXCO. APPLICATION: US 2003-404671
20030402. PRIORITY: JP 2002-101003 20020403.
- AB The present invention provides a pos. **resist** compn.
comprising a resin which itself is insol. or poorly sol. in an
alkali aq. soln. but becomes sol. in an alkali aq. soln. by the
action of an acid, an acid generator, and multifunctional epoxy
compd., wherein the content of halogen atoms in the resin is
≥40%, at least one of structural units constituting the resin
is a structural unit having an alicyclic hydrocarbon skeleton, and
the structural unit having an alicyclic hydrocarbon skeleton
contains therein at least one group rendering the resin sol. in an
alkali aq. soln. by the action of an acid, and at least one halogen
atom. The compn. is suitable for F2 excimer laser lithog. and
provides good quality **photoresist**.

IT 637035-72-4DP, ethoxymethylated
 (resin; pos. **resist** compn.)
 RN 637035-72-4 HCAPLUS
 CN Bicyclo[3.2.1]octan-3-ol, 1,2,2,7,7-pentafluoro-3-(trifluoromethyl)-
 , polymer with 1,2,2,7,7-pentafluoro-3-(trifluoromethyl)bicyclo[3.2.
 0]heptan-3-ol (9CI) (CA INDEX NAME)

CM 1

CRN 637035-71-3

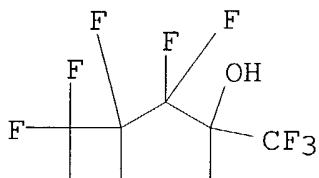
CMF C9 H8 F8 O



CM 2

CRN 637035-70-2

CMF C8 H6 F8 O



IC ICM C08F008-00
 NCL 525107000; 525523000; 525539000; 525416000
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and
 Other Reprographic Processes)
 Section cross-reference(s): 35
 ST pos **resist** compn
 IT Photoresists
 (pos. **resist** compn.)
 IT 112047-48-0
 (multi functional epoxy compd.; pos. **resist** compn.)
 IT 637035-72-4DP, ethoxymethylated
 (resin; pos. **resist** compn.)

L38 ANSWER 3 OF 8 HCAPLUS COPYRIGHT 2004 ACS on STN
2003:658740 Document No. 140:33572 Tetrafluoroethylene-based
fluoropolymers for 157-nm **resist** materials. Toriumi, M.;
Ishikawa, T.; Kodani, T.; Koh, M.; Moriya, T.; Araki, T.; Aoyama,
H.; Yamashita, T.; Yamazaki, T.; Furukawa, T.; Itani, T. (Daikin
Industries, Ltd., Osaka, 566-8585, Japan). Journal of Photopolymer
Science and Technology, 16(4), 607-613 (English) 2003. CODEN:
JSTEEW. ISSN: 0914-9244. Publisher: Technical Association of
Photopolymers, Japan.

AB Tetrafluoroethylene-based copolymers with functional norbornenes
were synthesized and their fundamental properties, such as
transparency at 157 nm and soly. in a std. alk. developer, were
characterized. A high transparency, i.e., absorbance of less than
0.5 μm^{-1} , was achieved by optimizing the polymn. conditions with
a variety of functional norbornene monomers. Pos.-working
resists formulated by the fluoro-resins were developed and
showed good transparency of less than 1 μm^{-1} at 157 nm, and good
developability without any swelling behavior in a std. alk. soln. of
0.26-N tetramethylammonium hydroxide, and an acceptable dry-etching
resistance as good as ArF **resists**. And fine patterns of
65-nm dense lines and spaces could be delineated by the exposure at
157-nm wavelength.

IT **634598-15-5**
(lithog. characterization of tetrafluoroethylene-norbornene
deriv. copolymers for chem. amplified 157-nm **photoresist**
materials)

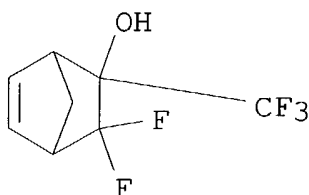
RN 634598-15-5 HCAPLUS

CN Bicyclo[2.2.1]hept-5-en-2-ol, 3,3-difluoro-2-(trifluoromethyl)-,
polymer with tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

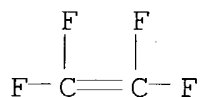
CRN 370102-71-9

CMF C8 H7 F5 O



CM 2

CRN 116-14-3
CMF C2 F4



- CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
- ST vacuum UV lithog tetrafluoroethylene norbornene based fluoropolymer pos **photoresist**
- IT UV absorption
(deep-UV; lithog. characterization of tetrafluoroethylene-norbornene deriv. copolymers for chem. amplified 157-nm **photoresist** materials)
- IT Absorptivity
IR spectra
(lithog. characterization of tetrafluoroethylene-norbornene deriv. copolymers for chem. amplified 157-nm **photoresist** materials)
- IT Fluoropolymers, properties
(lithog. characterization of tetrafluoroethylene-norbornene deriv. copolymers for chem. amplified 157-nm **photoresist** materials)
- IT Positive **photoresists**
(vacuum-UV, chem. amplified; lithog. characterization of tetrafluoroethylene-norbornene deriv. copolymers for chem. amplified 157-nm **photoresist** materials)
- IT 75-59-2, Tetramethylammonium hydroxide
(developer; lithog. characterization of tetrafluoroethylene-norbornene deriv. copolymers for chem. amplified 157-nm **photoresist** materials)
- IT 9003-53-6D, Polystyrene, fluorinated
(fluorination effect on optical property in relation to design of tetrafluoroethylene-based fluoropolymers for 157-nm **photoresists**)
- IT 357397-06-9P
(lithog. characterization of tetrafluoroethylene-norbornene deriv. copolymers for chem. amplified 157-nm **photoresist** materials)
- IT 196314-61-1 365568-56-5 484649-08-3 484649-09-4 484649-11-8
484649-23-2 **634598-15-5** 634598-16-6
(lithog. characterization of tetrafluoroethylene-norbornene deriv. copolymers for chem. amplified 157-nm **photoresist** materials)
- IT 66003-78-9, Triphenylsulfonium triflate

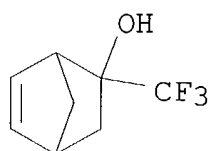
- (photoacid generator; lithog. characterization of tetrafluoroethylene-norbornene deriv. copolymers for chem. amplified 157-nm **photoresist** materials)
- IT 75-73-0, Carbon tetrafluoride 7782-44-7, Oxygen, uses (plasma etch; lithog. characterization of tetrafluoroethylene-norbornene deriv. copolymers for chem. amplified 157-nm **photoresist** materials)
- IT 108-94-1, Cyclohexanone, uses 110-43-0, 2-Heptanone 84540-57-8, Propylene glycol methyl ether acetate (**resist** formulation; lithog. characterization of tetrafluoroethylene-norbornene deriv. copolymers for chem. amplified 157-nm **photoresist** materials)
- IT 7631-86-9, Silica, processes (substrate; lithog. characterization of tetrafluoroethylene-norbornene deriv. copolymers for chem. amplified 157-nm **photoresist** materials)
- L38 ANSWER 4 OF 8 HCAPLUS COPYRIGHT 2004 ACS on STN
2002:799364 Document No. 138:376225 Advances in **resists** for 157-nm microlithography. Trinque, Brian C.; Osborn, Brian Philip; Chambers, Charles R.; Hsieh, Yu-Tsai; Corry, Schuyler Boon; Chiba, Takashi; Hung, Raymond Jui-Pu; Tran, Hoang Vi; Zimmerman, Paul; Miller, Daniel; Conley, Will; Willson, C. Grant (Dep. Chem. Chem. Eng., Univ. of Texas at Austin, Austin, TX, 78712, USA). Proceedings of SPIE-The International Society for Optical Engineering, 4690(Pt. 1, Advances in Resist Technology and Processing XIX), 58-68 (English) 2002. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International Society for Optical Engineering.
- AB The synthesis and characterization of several new fluoropolymers designed for use in the formulation of **photoresists** for exposure at 157 nm will be described. The design of these **resist** platforms is based on learning from previously reported fluorine-contg. materials. The authors have continued to explore anionic polymns., free radical polymns., metal-catalyzed addn. polymns. and metal-catalyzed copolymns. with carbon monoxide in theses studies. The monomers were characterized by vacuum-UV (VUV) spectrometry and polymers characterized by variable angle spectroscopic ellipsometry (VASE). **Resist** formulations based on these polymers were exposed at the 157 nm wavelength to produce high-resoln. images. The synthesis and structures of these new materials and the details of their processing will be presented.
- IT 482321-98-2P (design. and lithog. characteristics of vacuum-UV chem. amplified **photoresist** formulations based on polymers of fluorinated norbornenes)
- RN 482321-98-2 HCAPLUS
CN 2-Propenoic acid, 2-(trifluoromethyl)-, 1,1-dimethylethyl ester,

polymer with 2-(trifluoromethyl)bicyclo[2.2.1]hept-5-en-2-ol (9CI)
(CA INDEX NAME)

CM 1

CRN 370102-80-0

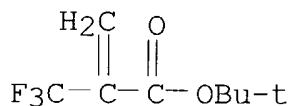
CMF C8 H9 F3 O



CM 2

CRN 105935-24-8

CMF C8 H11 F3 O2



IT **357397-07-0D**, reaction products with tert-Bu dicarbonate or
chloromethyl Et ether
(design. and lithog. characteristics of vacuum-UV chem. amplified
photoresist formulations based on polymers of fluorinated
norbornenes)

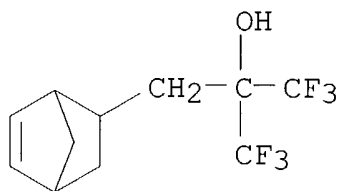
RN 357397-07-0 HCAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, α,α -
bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1

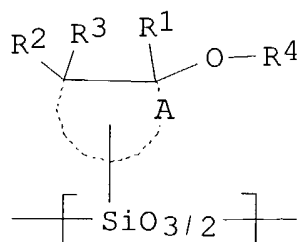
CMF C11 H12 F6 O



- CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 35, 36
- ST norbornene deriv fluoropolymer vacuum UV lithog **photoresist**
; fluoromethyl contg norbornene polymn vacuum UV photolithog **photoresist**
- IT Fluoropolymers, properties
(design. and lithog. characteristics of vacuum-UV chem. amplified **photoresist** formulations based on polymers of fluorinated norbornenes)
- IT **Photoresists**
(vacuum-UV, chem. amplified; design. and lithog. characteristics of vacuum-UV chem. amplified **photoresist** formulations based on polymers of fluorinated norbornenes)
- IT Optical absorption
(vacuum-UV; design. and lithog. characteristics of vacuum-UV chem. amplified **photoresist** formulations based on polymers of fluorinated norbornenes)
- IT 694-95-1 22847-05-8 70279-04-8, 7-Fluoronorbornane 328114-63-2
(absorption of fluorinated norbornenes in relation to design of fluoropolymers for vacuum-UV **photoresist** formulations)
- IT 370099-14-2 459418-30-5
(design. and lithog. characteristics of vacuum-UV chem. amplified **photoresist** formulations)
- IT **482321-98-2P** 524067-40-1P
(design. and lithog. characteristics of vacuum-UV chem. amplified **photoresist** formulations based on polymers of fluorinated norbornenes)
- IT 3188-13-4D, Chloromethyl ethyl ether, reaction product with bicycloheptene(trifluoromethylpropanol) homopolymer 24424-99-5D, Di-Tert-butyl dicarbonate, reaction product with bicycloheptene(trifluoromethylpropanol) homopolymer **357397-07-0D**, reaction products with tert-Bu dicarbonate or chloromethyl Et ether 457096-57-0
(design. and lithog. characteristics of vacuum-UV chem. amplified **photoresist** formulations based on polymers of fluorinated norbornenes)
- IT 75-59-2, Tetramethylammonium hydroxide
(developer; design. and lithog. characteristics of vacuum-UV

- chem. amplified **photoresist** formulations based on polymers of fluorinated norbornenes)
- IT 406702-06-5
(dissoln. inhibitor; design. and lithog. characteristics of vacuum-UV chem. amplified **photoresist** formulations based on polymers of fluorinated norbornenes)
- IT 370102-71-9P 479072-83-8P 524067-39-8P
(monomer; design. and lithog. characteristics of vacuum-UV chem. amplified **photoresist** formulations)
- IT 228123-17-9P 370102-80-0P
(monomer; synthesis of fluorinated norbornene and its spectra in relation to design. of vacuum-UV **photoresist** formulations)
- IT 144317-44-2, Triphenylsulfonium nonaflate
(photoacid generator; design. and lithog. characteristics of vacuum-UV chem. amplified **photoresist** formulations based on polymers of fluorinated norbornenes)
- L38 ANSWER 5 OF 8 HCAPLUS COPYRIGHT 2004 ACS on STN
2002:709220 Document No. 137:255337 Polymer in chemically amplified vacuum UV-sensitive **resist** composition and method for pattern formation using the same. Hatakeyama, Jun; Takahashi, Toshiaki; Watanabe, Atsushi; Ishihara, Toshinobu; Sasako, Masaru; Endo, Masataka; Kishimura, Shinji; Otani, Michitaka; Miyazawa, Satoru; Tsutsumi, Kentaro; Maeda, Kazuhiko (Shin-Etsu Chemical Industry Co., Ltd., Japan; Matsushita Electric Industrial Co., Ltd.; Central Glass Co., Ltd.). Jpn. Kokai Tokkyo Koho JP 2002268226 A2 20020918, 29 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-70208 20010313.

GI



I

- AB The title polymer has a repeating unit of structure I (A = divalent org. group; R1-3 = H, F, Cl-4 alkyl; R4 = acid-sensitive group). The polymer provides **photoresist** of high sensitivity, high resolu., and good plasma etching-resistance.
- IT 460731-95-7P 460731-97-9P

(polymer in chem. amplified vacuum UV-sensitive **resist** compn.)

RN 460731-95-7 HCAPLUS

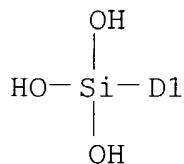
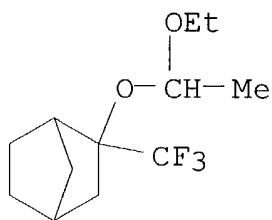
CN Silanetriol, [(1-ethoxyethoxy)(trifluoromethyl)bicyclo[2.2.1]hept-2-yl]-, polymer with [hydroxy(trifluoromethyl)bicyclo[2.2.1]hept-2-yl]silanetriol (9CI) (CA INDEX NAME)

CM 1

CRN 460731-94-6

CMF C12 H21 F3 O5 Si

CCI IDS

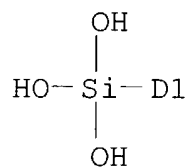
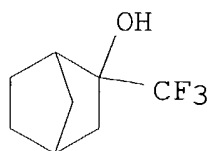


CM 2

CRN 460731-93-5

CMF C8 H13 F3 O4 Si

CCI IDS



RN 460731-97-9 HCAPLUS

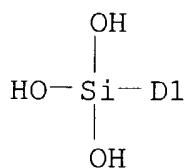
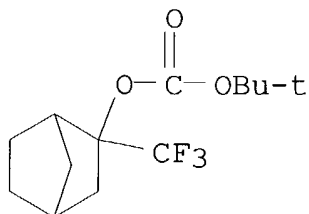
CN Carbonic acid, 1,1-dimethylethyl 2-(trifluoromethyl)-5(or 6)-(trihydroxysilyl)bicyclo[2.2.1]hept-2-yl ester, polymer with [hydroxy(trifluoromethyl)bicyclo[2.2.1]hept-2-yl]silanetriol (9CI) (CA INDEX NAME)

CM 1

CRN 460731-96-8

CMF C13 H21 F3 O6 Si

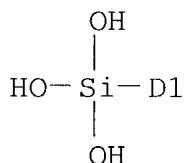
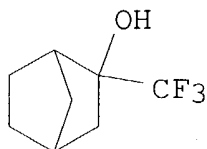
CCI IDS



CM 2

CRN 460731-93-5

CMF C8 H13 F3 O4 Si
CCI IDS



- IC ICM G03F007-039
ICS C08G077-24; C08K005-00; C08L083-08; G03F007-40; H01L021-027
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and
Other Reprographic Processes)
Section cross-reference(s): 35
ST polymer amplified vacuum UV sensitive **resist** compn
IT **Photoresists**
(UV; polymer in chem. amplified vacuum UV-sensitive
resist compn. and method for pattern formation using
same)
IT Polysiloxanes, preparation
(polymer in chem. amplified vacuum UV-sensitive **resist**
compn.)
IT 75-36-5, Acetyl chloride 77-73-6, Dicyclopentadiene 421-50-1,
1,1,1-Trifluoroacetone 10025-78-2, Trichlorosilane
(polymer in chem. amplified vacuum UV-sensitive **resist**
compn.)
IT 374-00-5P 406702-03-2P 460731-92-4P
(polymer in chem. amplified vacuum UV-sensitive **resist**
compn.)
IT 460731-93-5P **460731-95-7P 460731-97-9P**
(polymer in chem. amplified vacuum UV-sensitive **resist**
compn.)

L38 ANSWER 6 OF 8 HCAPLUS COPYRIGHT 2004 ACS on STN
2002:633326 Document No. 138:80557 The design of **resist**
materials for 157 nm lithography. Willson, C. Grant; Trinquet, Brian
C.; Osborn, Brian P.; Chambers, Charles R.; Hsieh, Yu-Tsai; Chiba,
Takashi; Zimmerman, Paul; Miller, Daniel; Conley, Willard
(Department of Chemistry, University of Texas at Austin, Austin, TX,

78759, USA). Journal of Photopolymer Science and Technology, 15(4), 583-590 (English) 2002. CODEN: JSTEEW. ISSN: 0914-9244. Publisher: Technical Association of Photopolymers, Japan.

AB The synthesis and characterization of several new fluoropolymers designed for use in the formulation of **photoresists** for exposure at 157 nm will be described. The design of these **resist** platforms is based on learning from previously reported fluorine-contg. materials. The authors have continued to explore anionic polymns., free radical polymns., metal-catalyzed addn. polymns. and metal-catalyzed copolymns. with carbon monoxide in these studies. A new, three component design for 157 nm **resists** will also be presented. The monomers were characterized by vacuum-UV (VUV) spectrometry and polymers characterized by variable angle spectroscopic ellipsometry (VASE). **Resist** formulations based on these polymers were exposed at the 157 nm wavelength to produce high-resoln. images. The synthesis and structures of these new materials and the details of their processing will be presented.

IT **357397-07-0D**, reaction product with di-tert-Bu dicarbonate or chloromethyl Et ether **482321-98-2**
(design and imaging capability of addn. polymers made of fluorinated monomers for application as vacuum-UV **photoresists**)

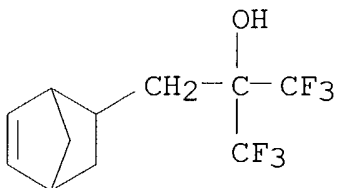
RN 357397-07-0 HCAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, α,α -bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1

CMF C11 H12 F6 O

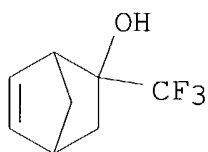


RN 482321-98-2 HCAPLUS

CN 2-Propenoic acid, 2-(trifluoromethyl)-, 1,1-dimethylethyl ester, polymer with 2-(trifluoromethyl)bicyclo[2.2.1]hept-5-en-2-ol (9CI) (CA INDEX NAME)

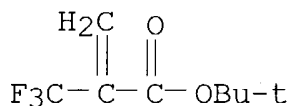
CM 1

CRN 370102-80-0
CMF C8 H9 F3 O



CM 2

CRN 105935-24-8
CMF C8 H11 F3 O2



IT 357397-07-0

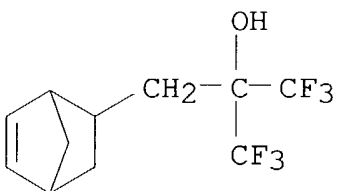
(design and imaging capability of addn. polymers made of
fluorinated monomers for application as vacuum-UV
photoresists)

RN 357397-07-0 HCAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, α,α -
bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1
CMF C11 H12 F6 O



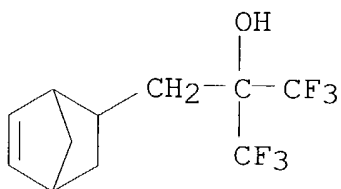
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and
Other Reprographic Processes)

ST vacuum UV **photoresist** lithog fluoropolymer design

- IT Polycarbonates, uses
(dissoln. inhibitor; design and imaging capability of addn. polymers made of fluorinated monomers for application as vacuum-UV **photoresists**)
- IT Molecular structure-property relationship
Polymerization
Transparency
Vacuum UV spectra
(properties and design and imaging capability of addn. polymers made of fluorinated monomers for application as vacuum-UV **photoresists**)
- IT Fluoropolymers, properties
(properties and design and imaging capability of addn. polymers made of fluorinated monomers for application as vacuum-UV **photoresists**)
- IT Ellipsometry
(spectroscopic, variable angle; properties and design and imaging capability of addn. polymers made of fluorinated monomers for application as vacuum-UV **photoresists**)
- IT Positive **photoresists**
(vacuum-UV; properties and design and imaging capability of addn. polymers made of fluorinated monomers for application as vacuum-UV **photoresists**)
- IT 3188-13-4D, Chloromethyl ethyl ether, reaction product with Bicycloheptene(trifluorotrifluoromethylpropaneol) homopolymer
24424-99-5D, Di-tert-butyl dicarbonate, reaction product with Bicycloheptene(trifluorotrifluoromethylpropaneol) homopolymer
357397-07-0D, reaction product with di-tert-Bu dicarbonate or chloromethyl Et ether 482321-97-1 **482321-98-2**
482322-00-9
(design and imaging capability of addn. polymers made of fluorinated monomers for application as vacuum-UV **photoresists**)
- IT **357397-07-0**
(design and imaging capability of addn. polymers made of fluorinated monomers for application as vacuum-UV **photoresists**)
- IT 75-59-2, Tetramethylammonium hydroxide
(developer; properties and design and imaging capability of addn. polymers made of fluorinated monomers for application as vacuum-UV **photoresists**)
- IT 24936-68-3, uses 25037-45-0 457096-61-6
(dissoln. inhibitor; design and imaging capability of addn. polymers made of fluorinated monomers for application as vacuum-UV **photoresists**)
- IT 370102-71-9
(monomer; design and imaging capability of addn. polymers made of fluorinated monomers for application as vacuum-UV

- photoresists)**
- IT 370102-80-0 479072-83-8 482321-96-0 482321-99-3
(monomer; design and imaging capability of addn. polymers made of fluorinated monomers for application as vacuum-UV
- photoresists)**
- IT 406702-06-5
(properties and design and imaging capability of addn. polymers made of fluorinated monomers for application as vacuum-UV
- photoresists)**
- L38 ANSWER 7 OF 8 HCAPLUS COPYRIGHT 2004 ACS on STN
2001:803902 Document No. 136:126408 Transparent resins for 157-nm lithography. Dammel, Ralph R.; Sakamuri, Raj; Romano, Andrew R.; Vicari, Richard; Hacker, Cheryl; Conley, Will; Miller, Daniel A. (AZ Electronic Materials, Clariant Corporation, Somerville, NJ, USA). Proceedings of SPIE-The International Society for Optical Engineering, 4345(Pt. 1, Advances in Resist Technology and Processing XVIII), 350-360 (English) 2001. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International Society for Optical Engineering.
- AB The development of sufficiently transparent resin systems is one of the key elements required for a successful and timely introduction for 157 nm lithog. This paper reports on the Simple Transmission Understanding and Prediction by Incremental Diln. (STUPID) model, a quick back-of-the-envelope increment scheme to est. the absorption of polymers at 157 nm. A no. of promising candidate resins based on norbornenes are discussed, and results with a first 157 nm resin system developed at the University of Austin are presented. The new system is based on copolymers of norbornene-5-methylenehexafluoroisopropanol (NMHFA) and t-Bu norbornene carboxylate (BNC), formulated with an acetal additive obtained by copolymn. of t-Bu norbornene-5-trifluoromethyl-5-carboxylate (BNTC) with carbon monoxide. Lithog. performance of this system extends to 110 nm dense features using std. illumination and a binary **mask**, or 80 nm semi-dense and 60 nm isolated features with a strong phase shift **mask**. The dry etch resistance of this **resist** is found to be slightly lower than APEX-E DUV **resist** for polysilicon but superior to it for oxide etches.
- IT 357397-07-0 370102-72-0 370102-74-2
370102-81-1
(fluorine-contg. norbornene transparent resins for 157-nm lithog.)
- RN 357397-07-0 HCAPLUS
- CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, α,α -bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

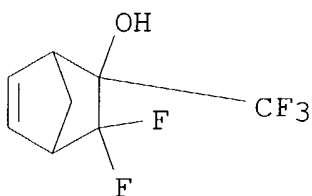
CRN 196314-61-1
CMF C11 H12 F6 O



RN 370102-72-0 HCAPLUS
CN Bicyclo[2.2.1]hept-5-en-2-ol, 3,3-difluoro-2-(trifluoromethyl)-,
homopolymer (9CI) (CA INDEX NAME)

CM 1

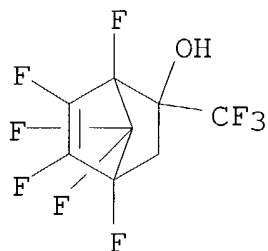
CRN 370102-71-9
CMF C8 H7 F5 O



RN 370102-74-2 HCAPLUS
CN Bicyclo[2.2.1]hept-5-en-2-ol, 1,4,5,6,7,7-hexafluoro-2-
(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

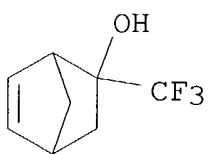
CRN 370102-73-1
CMF C8 H3 F9 O



RN 370102-81-1 HCAPLUS
 CN Bicyclo[2.2.1]hept-5-en-2-ol, 2-(trifluoromethyl)-, homopolymer
 (9CI) (CA INDEX NAME)

CM 1

CRN 370102-80-0
 CMF C8 H9 F3 O



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and
 Other Reprographic Processes)

Section cross-reference(s): 38

ST fluorine norbornene photolithog **photoresist** UV absorption

IT Absorption spectra

Dilution

Inductive effect

Photoresists

(fluorine-contg. norbornene transparent resins for 157-nm
 lithog.)

IT 88403-53-6 144317-44-2, Triphenylsulfonium nonaflate 302580-86-5

357397-06-9 **357397-07-0** 367524-27-4 370099-14-2

370102-69-5 **370102-72-0** **370102-74-2**

370102-75-3 370102-77-5 370102-79-7 **370102-81-1**

370102-83-3

(fluorine-contg. norbornene transparent resins for 157-nm
 lithog.)

L38 ANSWER 8 OF 8 HCAPLUS COPYRIGHT 2004 ACS on STN

2001:621452 Document No. 135:331952 New resin systems for 157 nm

lithography. Dammel, Ralph R.; Sakamuri, Raj; Kudo, Takanori; Romano, Andrew; Rhodes, Larry; Vicari, Richard; Hacker, Cheryl; Conley, Will; Miller, Daniel (AZ Electronic Materials, Clariant Corporation, Somerville, NJ, USA). Journal of Photopolymer Science and Technology, 14(4), 603-612 (English) 2001. CODEN: JSTEEW. ISSN: 0914-9244. Publisher: Technical Association of Photopolymers, Japan.

AB The development of sufficiently transparent resin systems is one of the key elements required for a successful and timely introduction of 157 nm lithog. This paper reports on the "Simple Transmission Understanding and Prediction by Incremental Diln." (STUPID) model, a quick back-of-the-envelope increment scheme to est. the absorption of polymers at 157 nm. A no. of promising candidate resins based on norbornenes are discussed, and results with a first 157 nm resin system developed at the University of Austin are presented. The new system is based on copolymers of norbornene-5-methylenehexafluoroisopropanol (NMHFA) and t-Bu norbornenecarboxylate (BNC), formulated with an acetal additive obtained by copolymn. of t-Bu norbornene-5-trifluoromethyl-5-carboxylate (BNTC) with carbon monoxide. Lithog. performance of this system extends to 110 nm dense features using std. illumination and a binary **mask**, or 80 nm semi-dense and 60 nm isolated features with a strong phase shift **mask**. The dry etch resistance of this **resist** is found to be slightly lower than APEX-E DUV **resist** for polysilicon but superior to it for oxide etches.

IT 357397-07-0 370102-72-0 370102-74-2
370102-81-1

(model for estn. of UV absorption of)

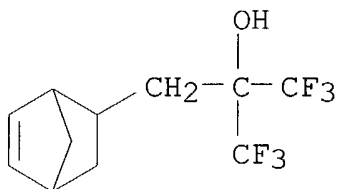
RN 357397-07-0 HCAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, α,α -bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1

CMF C11 H12 F6 O



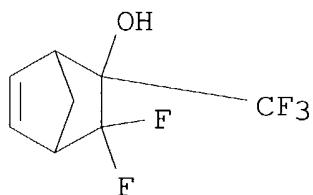
RN 370102-72-0 HCAPLUS

CN Bicyclo[2.2.1]hept-5-en-2-ol, 3,3-difluoro-2-(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 370102-71-9

CMF C8 H7 F5 O



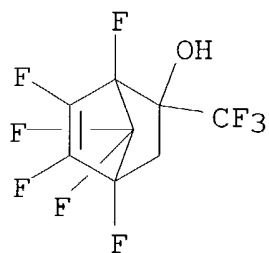
RN 370102-74-2 HCAPLUS

CN Bicyclo[2.2.1]hept-5-en-2-ol, 1,4,5,6,7,7-hexafluoro-2-(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 370102-73-1

CMF C8 H3 F9 O



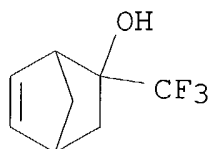
RN 370102-81-1 HCAPLUS

CN Bicyclo[2.2.1]hept-5-en-2-ol, 2-(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 370102-80-0

CMF C8 H9 F3 O

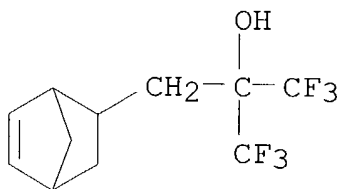


- CC 37-3 (Plastics Manufacture and Processing)
Section cross-reference(s): 73, 74
- ST lithog **photoresist** fluoro norbornene resin; UV absorption
estn polymer
- IT Electrooptical absorption
Lithography
Photoresists
(norbornene resin systems for 157 nm lithog. and model for estn.
of UV absorption)
- IT 382-90-1, Methyl 2-trifluoromethylacrylate 88403-53-6
302580-86-5 357397-06-9 **357397-07-0** 370102-69-5
370102-72-0 370102-74-2 370102-75-3
370102-77-5 370102-79-7 **370102-81-1** 370102-83-3
(model for estn. of UV absorption of)
- => d 140 3,6,9,12,15,18,21,24,27 cbib abs hitstr hitind
- L40 ANSWER 3 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
2003:661735 Document No. 140:33575 Fluorinated chemically amplified
dissolution inhibitors for 157 nm nanolithography. Fresco, Zachary
M.; Bense, Nicolas; Suez, Itai; Backer, Scott A.; Frechet, Jean M.
J.; Conley, Will (Department of Chemistry, University of California,
Berkeley, CA, 94720-1460, USA). Journal of Photopolymer Science and
Technology, 16(1), 27-35 (English) 2003. CODEN: JSTEEW.
ISSN: 0914-9244. Publisher: Technical Association of Photopolymers,
Japan.
- AB The authors present the synthesis and screening of a series of new
fluorinated materials designed to act as chem. amplified dissoln.
inhibitors for 157 nm lithog. Dissoln. rates measured using a
quartz crystal microbalance app. on a variety of matrix polymers as
well as initial results demonstrating the image-ability of this
multi-component system are described.
- IT **357397-07-0**
(matrix polymer; design and synthesis and lithog. properties of
fluorinated chem. amplified dissoln. inhibitors for 157 nm
nanolithog.)
- RN 357397-07-0 HCAPLUS
- CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, α,α -
bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1

CMF C11 H12 F6 O



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST fluorinated chem amplified **photoresist** dissoln inhibitor
vacuum UV lithog

IT Photolithography

Photoresists

(vacuum-UV; design and synthesis of fluorinated chem. amplified dissoln. inhibitors for 157 nm nanolithog.)

IT 24979-70-2, 4-Hydroxystyrene homopolymer 114885-79-9
357397-07-0 634194-34-6

(matrix polymer; design and synthesis and lithog. properties of fluorinated chem. amplified dissoln. inhibitors for 157 nm nanolithog.)

IT 84540-57-8, Propylene glycol monomethyl ether acetate
(**resist** formulation; design and synthesis and lithog. properties of fluorinated chem. amplified dissoln. inhibitors for 157 nm nanolithog.)

L40 ANSWER 6 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN

2003:570067 Dissolution behavior of bis-trifluoromethyl-carbinol-substituted polynorbornenes. Hoskins, Trevor; Chung, Won Jae; Ludovice, Peter J.; Henderson, Clifford L.; Seger, Larry; Rhodes, Larry F.; Shick, Robert A. (Georgia Institute of Technology, Atlanta, GA, 30332-0100, USA). Proceedings of SPIE-The International Society for Optical Engineering, 5039(Pt. 1, Advances in Resist Technology and Processing XX), 600-611 (English) **2003**. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International Society for Optical Engineering.

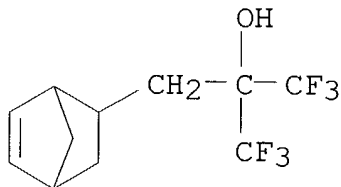
AB As features shrink below 100 nm, new exposure technologies such as 157 nm lithog. are being developed. One of the crit. challenges in developing these new lithog. tools and processes is the development of appropriate **resist** materials that can be used at these lower exposure wavelengths. Creating org. **resist** polymer

resins for 157 nm exposure is a particularly challenging issue since many org. functional groups absorb at this wavelength. It has been previously shown that fluorinated polymers may offer the required low optical absorbance needed to serve as **resist** resins for 157 nm lithog. In particular, there has been interest in bis-trifluoromethyl carbinol substituted polynorbornenes (HFAPNB) and similar materials for use in **photoresists**. The bis-trifluoromethyl carbinol group offers a base sol. group that is sufficiently transparent to be used at 157 nm. This work has focused on the dissoln. behavior and other characteristics of bis-trifluoromethyl carbinol substituted polynorbornenes. In particular, it was found that the dissoln. behavior of the HFAPNB homopolymer is strongly controlled by its ability to hydrogen bond with both neighboring chains and also other small mol. additives such as dissoln. inhibitors and photoacid generators. A detailed mol. level explanation for these effects is presented. The interaction of a series of com. photoacid generators with HFAPNB polymers are presented. The use of such information for the rational design of advanced **resist** materials using these polymers will be discussed.

IT **357397-07-0**
 (dissoln. rate as function of mol. structure of
 bis-trifluoromethylcarbinol substituted polynorbornene-based
 chem. amplification **photoresists** for 157 nm lithog.)
 RN 357397-07-0 HCAPLUS
 CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, α,α -
 bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1
 CMF C11 H12 F6 O



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and
 Other Reprographic Processes)
 ST dissoln behavior trifluoromethylcarbinol substituted polynorbornene;
 vacuum UV chem amplification **photoresist**
 fluoromethylcarbinol pendant norbornene polymer
 IT Hydrogen bond

IR spectra

Molecular structure-property relationship

Molecular weight

(dissoln. rate as function of mol. structure of
bis-trifluoromethylcarbinol substituted polynorbornene-based
chem. amplification **photoresists** for 157 nm lithog.)

IT Dissolution

(kinetics; dissoln. rate as function of mol. structure of
bis-trifluoromethylcarbinol substituted polynorbornene-based
chem. amplification **photoresists** for 157 nm lithog.)

IT **Photoresists**

(vacuum-UV, chem. amplified; dissoln. rate as function of mol.
structure of bis-trifluoromethylcarbinol substituted
polynorbornene-based chem. amplification **photoresists**
for 157 nm lithog.)

IT 75-59-2, Tetramethylammonium hydroxide

(developer; dissoln. rate as function of mol. structure of
bis-trifluoromethylcarbinol substituted polynorbornene-based
chem. amplification **photoresists** for 157 nm lithog.)

IT **357397-07-0**

(dissoln. rate as function of mol. structure of
bis-trifluoromethylcarbinol substituted polynorbornene-based
chem. amplification **photoresists** for 157 nm lithog.)

IT 144317-44-2, Triphenylsulfonium nonaflate 460731-17-3

460731-18-4 460731-32-2 524067-96-7 524067-97-8 541547-03-9
(photoacid generator; dissoln. rate as function of mol. structure
of bis-trifluoromethylcarbinol substituted polynorbornene-based
chem. amplification **photoresists** for 157 nm lithog.)

L40 ANSWER 9 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN

2003:570027 Document No. 140:154322 Equilibrium sorption and rate of
diffusion of water into **photoresist** thin films. Berger,
Cody M.; Henderson, Clifford L. (School of Chemical Engineering,
Georgia Institute of Technology, Atlanta, GA, 30332, USA).
Proceedings of SPIE-The International Society for Optical
Engineering, 5039(Pt. 2, Advances in Resist Technology and
Processing XX), 984-995 (English) 2003. CODEN: PSISDG.
ISSN: 0277-786X. Publisher: SPIE-The International Society for
Optical Engineering.

AB The equil. **resist** film water content at various water
partial pressures and the rate of diffusion of water into
photoresist thin films was investigated for three model
resist polymers: (1) a traditional novolak matrix, (2)
poly(p-hydroxystyrene), and (3) bis-trifluoromethyl carbinol
substituted polynorbornene. A quartz crystal microbalance (QCM) was
used to measure the mass of water added to **resist** films
exposed to environments of differing relative humidity. All three
polymer systems absorbed significant quantities of water at 100%

relative humidity with PHOST absorbing the most (9.8wt.%) followed by the polynorbornenes (5-8 wt%) and the novolak (2-3 wt%). The diffusion of water into the polymer films was obsd. to follow Fickian diffusion behavior initially ($M_t/M_s < 0.6$) followed by behavior indicative of concn. dependent diffusion at large water uptake values. Finally, interdigitated electrodes were utilized to est. the impact of varying humidity upon the net dielec. const. of the **resist** films. A linear relationship was obsd. for measured capacitance vs. water uptake for all polymers measured and a power law dielec. mixing rule was found to properly describe the effective dielec. const. of the water/polymer mixts.

IT 357397-07-0

(equil. **resist** film water content at various water partial pressures and rate of diffusion of water into **photoresist** thin films)

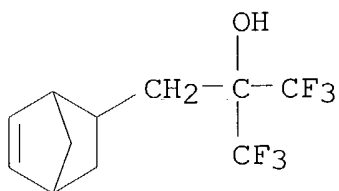
RN 357397-07-0 HCAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, α, α -bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1

CMF C11 H12 F6 O



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST water equil sorption diffusion rate polymer **photoresist** thin film

IT Absorption

Dielectric constant

Diffusion

(equil. **resist** film water content at various water partial pressures and rate of diffusion of water into **photoresist** thin films)

IT Electric capacitance

(linear relationship of capacitance vs. water uptake for polymer **photoresists**)

IT Phenolic resins, properties

(novolak; equil. **resist** film water content at various

water partial pressures and rate of diffusion of water into
photoresist thin films)

IT Humidity

(relative; equil. **resist** film water content at various
water partial pressures and rate of diffusion of water into
photoresist thin films)

IT 7732-18-5, Water, properties 9016-83-5, Cresol-formaldehyde
copolymer 24979-70-2, Poly(p-hydroxystyrene) **357397-07-0**

(equil. **resist** film water content at various water
partial pressures and rate of diffusion of water into
photoresist thin films)

L40 ANSWER 12 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN

2003:472544 Document No. 139:53762 Method for manufacture and use of
polycyclic polymers as **photoresists** in the manufacture of
integrated circuits. Rhodes, Larry F.; Vicari, Richard; Langsdorf,
Leah J.; Sobek, Andrew A.; Boyd, Edwin P.; Bennett, Brian (Sumitomo
Bakelite Co., Ltd., Japan). PCT Int. Appl. WO 2003050158 A1
20030619, 85 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ,
BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE,
GH, GM, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT,
LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG,
SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ,
MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK,
ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN,
TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2002-IB5795
20021212. PRIORITY: US 2001-PV340526 20011212.

AB In one embodiment, the present invention relates to
photoresist compns. formed from the polymn. of at least one
halogenated polycyclic monomer or hydrohalogenated polycyclic
monomer. In another embodiment, the present invention relates to
photoresist compns. formed from the copolymn. of at least
one halogenated polycyclic monomer or hydrohalogenated polycyclic
monomer with at least one non-halogenated polycyclic monomer.
Addnl., the present invention relates to methods by which to
post-treat such **photoresist** compns. in order to obtain one
or more of: (1) a redn. in optical d. of the polymer compn.; and (2)
a redn. in the amt. of residual metal and/or monomer in the polymer
compn. Also disclosed are catalyst systems for use in producing the
photoresist compns. of the present invention which permit
mol. wt. control of the **photoresist** products.

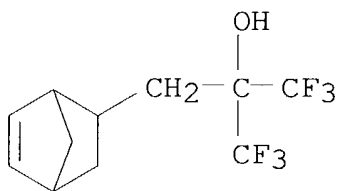
IT **357397-07-0DP**, α,α -Bis(trifluoromethyl)bicyclo[2
.2.1]hept-5-ene-2-ethanol homopolymer, unsatd. group-terminated,
epoxidized and ring-opening reaction or hydrogenated products
357397-07-0P, α,α -Bis(trifluoromethyl)bicyclo[2.
2.1]hept-5-ene-2-ethanol homopolymer

(method for manuf. and use of polycyclic polymers as
photoresists in manuf. of integrated circuits)

RN 357397-07-0 HCAPLUS
CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, α,α -
bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

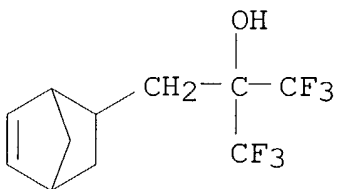
CRN 196314-61-1
CMF C11 H12 F6 O



RN 357397-07-0 HCAPLUS
CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, α,α -
bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1
CMF C11 H12 F6 O



IC ICM C08G061-00
ICS C08F232-08; G03F007-004
CC 37-3 (Plastics Manufacture and Processing)
Section cross-reference(s): 38, 74, 76, 78
ST halogenated polycyclic monomer polymer manuf **photoresist**
integrated circuit
IT Polycyclic compounds
(halogenated, polymers; method for manuf. and use of polycyclic
polymers as **photoresists** in manuf. of integrated
circuits)
IT Integrated circuits
Photoresists

- Polymerization catalysts
Printed circuit boards
Semiconductor devices
 (method for manuf. and use of polycyclic polymers as
 photoresists in manuf. of integrated circuits)
- IT Fluoropolymers, preparation
 (method for manuf. and use of polycyclic polymers as
 photoresists in manuf. of integrated circuits)
- IT 74-85-1, Ethene, reactions 142-29-0, Cyclopentene 592-41-6,
1-Hexene, reactions
 (chain-transfer agents; method for manuf. and use of polycyclic
 polymers as **photoresists** in manuf. of integrated
 circuits)
- IT 2797-28-6, Lithium tetrakis(pentafluorophenyl)borate 66197-14-6,
(Toluene)bis(perfluorophenyl)nickel 118612-00-3,
N,N-Dimethylanilinium tetrakis(pentafluorophenyl)borate
377077-16-2
 (co-catalysts; method for manuf. and use of polycyclic polymers
 as **photoresists** in manuf. of integrated circuits)
- IT 545386-12-7P
 (crystal structure; method for manuf. and use of polycyclic
 polymers as **photoresists** in manuf. of integrated
 circuits)
- IT 617-86-7, Triethylsilane
 (hydrosilylating agent; method for manuf. and use of polycyclic
 polymers as **photoresists** in manuf. of integrated
 circuits)
- IT 64536-78-3
 (method for manuf. and use of polycyclic polymers as
 photoresists in manuf. of integrated circuits)
- IT 545386-13-8P 545401-38-5P
 (method for manuf. and use of polycyclic polymers as
 photoresists in manuf. of integrated circuits)
- IT 357397-07-ODP, α,α -Bis(trifluoromethyl)bicyclo[2
.2.1]hept-5-ene-2-ethanol homopolymer, unsatd. group-terminated,
epoxidized and ring-opening reaction or hydrogenated products
357397-07-OP, α,α -Bis(trifluoromethyl)bicyclo[2.
2.1]hept-5-ene-2-ethanol homopolymer 370099-14-2DP, unsatd.
group-terminated, optionally modified
 (method for manuf. and use of polycyclic polymers as
 photoresists in manuf. of integrated circuits)
- IT 2622-14-2, Tricyclohexylphosphine 3375-31-3, Palladium(II) acetate
4125-25-1, Triisobutylphosphine 6372-40-3,
Isopropyldiphenylphosphine 6372-42-5, Cyclohexyldiphenylphosphine
6372-43-6, Diisopropylphenylphosphine 6476-36-4,
Triisopropylphosphine 7650-88-6, Tricyclopentylphosphine
7650-89-7, Tribenzylphosphine 70073-11-9 76257-41-5
 (reactant for catalyst; method for manuf. and use of polycyclic

polymers as **photoresists** in manuf. of integrated circuits)

L40 ANSWER 15 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN

2002:799368 Document No. 138:376264 Negative **photoresist** for 157-nm microlithography; a progress report. Conley, Will; Trinquet, Brian C.; Miller, Daniel A.; Zimmerman, Paul; Kudo, Takanori; Dammel, Ralph R.; Romano, Andrew R.; Willson, C. Grant (International SEMATECH, Austin, TX, USA). Proceedings of SPIE-The International Society for Optical Engineering, 4690(Pt. 1, Advances in Resist Technology and Processing XIX), 94-100 (English) 2002. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International Society for Optical Engineering.

AB The design of 157 nm **photoresists** is a daunting task since air, water, and most org. compds. are opaque at this wavelength. Spectroscopic studies led to the observation that fluorinated hydrocarbons and siloxanes offer the best hope for the transparency that is necessary for the design of an effective 157 nm **photoresist**, and these classes of materials have quickly become the prominent platforms for a variety of research activities in this field. There have been a no. of authors that have suggested that neg. **resists** have unique attributes for specific device applications. Numerous authors have discussed neg. **photoresists** over the years. There are many uses for such materials at various levels in a semiconductor device. One such use is with complementary phase shift **mask** thus eliminating the need for a second exposure step. This paper reports the authors recent progress toward developing a neg. 157 nm **resist** materials based on fluoropolymers with crosslinkers that are transparent at 157 nm. The authors will report on the synthesis of the polymers used in this work along with the crosslinkers and other additives used in the formulation of the **photoresist**. Imaging expts. at practical film thicknesses at 157 nm with binary and strong phase shifting **masks** will be shown demonstrating imaging capabilities. Spectroscopic data demonstrating chem. mechanisms and material absorbance will be shown along with other process related information.

IT 357397-07-0

(base polymer; spectroscopic characterization of neg. **photoresist** formulations for 157 nm lithog.)

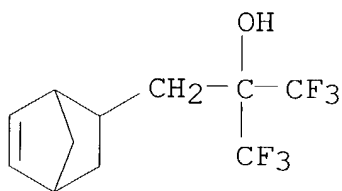
RN 357397-07-0 HCAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, α,α -bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1

CMF C11 H12 F6 O



- CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
- ST neg fluoropolymer based **photoresist** material vacuum UV lithog
- IT UV and visible spectra
(absorption; spectroscopic characterization of neg. **photoresist** formulations for 157 nm lithog.)
- IT Absorption spectra
IR spectra
(spectroscopic characterization of neg. **photoresist** formulations for 157 nm lithog.)
- IT Fluoropolymers, properties
(spectroscopic characterization of neg. **photoresist** formulations for 157 nm lithog.)
- IT Negative **photoresists**
(vacuum-UV, chem. amplified; spectroscopic characterization of neg. **photoresist** formulations for 157 nm lithog.)
- IT 24979-70-2, p-Hydroxystyrene homopolymer **357397-07-0**
524060-71-7
(base polymer; spectroscopic characterization of neg. **photoresist** formulations for 157 nm lithog.)
- IT 3089-11-0 524060-68-2
(crosslinker; spectroscopic characterization of neg. **photoresist** formulations for 157 nm lithog.)
- IT 524060-69-3 524060-72-8
(image area; spectroscopic characterization of neg. **photoresist** formulations for 157 nm lithog.)
- IT 144317-44-2, Triphenylsulfonium nonaflate
(photoacid generator; spectroscopic characterization of neg. **photoresist** formulations for 157 nm lithog.)

L40 ANSWER 18 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
2002:633335 Document No. 138:47155 Dissolution characteristics of acidic groups for 157-nm **resist**. Kishimura, Shinji; Endo, Masayuki; Sasago, Masaru (ULSI Process Technology Development Center, Corporate Manufacturing & Development Division, Semiconductor Company, Matsushita Electric Industrial Co., Ltd., Kyoto, 601-8413, Japan). Journal of Photopolymer Science and

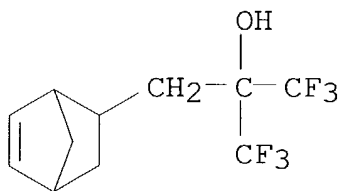
Technology, 15(4), 625-628 (English) 2002. CODEN: JSTE EW.
ISSN: 0914-9244. Publisher: Technical Association of Photopolymers,
Japan.

AB The dissoln. rates of conventional 157-nm **resist** polymers
contg. the hexafluoroisopropanol (HFA) group or the vinyl sulfonyl
group in various concns. of tetramethylammonium hydroxide (TMAH)
soln. were detd. The conventional alk. sol. **resist**
polymers used were novolak resin, poly(p-hydroxystyrene) (PHS), the
copolymer of methacrylic acid and methacrylate (poly(MAA/MA)), and
the alternating copolymer of norbornene-5-carboxylic acid and maleic
anhydride (poly(NbCOOH/MaAn)). The copolymers of
2-trifluoromethylacrylic acid and 4-(1,1,1,3,3,3-hexafluoro-2-
hydroxypropyl) styrene (HFASt), 2-trifluoromethylacrylic acid and
 α,α -bis(trifluoromethyl)-bicyclo[2.2.1]hept-5-ene-2-
ethanol, vinyl sulfonyl fluoride and HFASt, and vinyl sulfonic acid
and HFASt were used as alk. sol. polymers contg. fluorine or
sulfonyl for the 157-nm **resist**. The results indicate that
HFASt and vinyl sulfonic acid are excellent acidic groups for use
with 157-nm **resists**.

IT **357397-07-0**
(dissoln. rates of **photoresist** polymers contg.
hexafluoroisopropanol group for vacuum-UV lithog. in solns. of
tetramethylammonium hydroxide)
RN 357397-07-0 HCAPLUS
CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, α,α -
bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1
CMF C11 H12 F6 O



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and
Other Reprographic Processes)
ST **photoresist** lithog dissoln polymer hexafluoroisopropanol
vinylsulfonyl group; **resist** vacuum UV photolithog dissoln
rate tetramethylammonium hydroxide
IT Dissolution
Dissolution rate

Photoresists

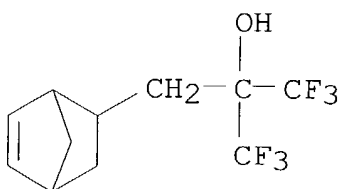
- (dissoln. rates of **photoresist** polymers for g/i-line and deep-UV and vacuum-UV lithog. in solns. of tetramethylammonium hydroxide)
- IT Fluoropolymers, properties
(dissoln. rates of **photoresist** polymers for g/i-line and deep-UV and vacuum-UV lithog. in solns. of tetramethylammonium hydroxide)
- IT Functional groups
(hexafluoroisopropanol, vinylsulfonyl; dissoln. rates of **photoresist** polymers contg. hexafluoroisopropanol group for vacuum-UV lithog. in solns. of tetramethylammonium hydroxide)
- IT Phenolic resins, properties
(novolak; dissoln. rates of **photoresist** polymers for g/i-line and deep-UV and vacuum-UV lithog. in solns. of tetramethylammonium hydroxide)
- IT 116352-29-5 **357397-07-0** 419543-04-7 478548-61-7
478548-62-8 478548-63-9
(dissoln. rates of **photoresist** polymers contg. hexafluoroisopropanol group for vacuum-UV lithog. in solns. of tetramethylammonium hydroxide)
- IT 75-59-2, Tetramethylammonium hydroxide
(dissoln. rates of **photoresist** polymers for g/i-line and deep-UV and vacuum-UV lithog. in solns. of tetramethylammonium hydroxide)
- IT 79-41-4D, Methacrylic acid, esters, polymers with methacrylic acid
79-41-4D, Methacrylic acid, polymers with methacrylates
24979-70-2, Poly(p-hydroxystyrene) 28551-72-6, Maleic anhydride-norbornene-5-carboxylic acid alternating copolymer
(dissoln. rates of **photoresist** polymers for g/i-line and deep-UV and vacuum-UV lithog. in solns. of tetramethylammonium hydroxide)
- L40 ANSWER 21 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
2002:633328 Document No. 138:47153 Fluoropolymers for 157/193 nm lithography: chemistry, new platform, formulation strategy, and lithographic evaluation. Ito, H.; Truong, H. D.; Okazaki, M.; Miller, D. C.; Fender, N.; Brock, P. J.; Wallraff, G. M.; Larson, C. E.; Allen, R. D. (IBM Almaden Research Center, San Jose, CA, 95120, USA). Journal of Photopolymer Science and Technology, 15(4), 591-602 (English) 2002. CODEN: JSTEEW. ISSN: 0914-9244. Publisher: Technical Association of Photopolymers, Japan.
- AB A copolymer of tert-Bu 2-trifluoromethylacrylate (TBTFMA) and norbornene bearing hexafluoroisopropanol (NBHFA) as an acid group, which is prepd. by radical copolymn., is employed in the authors 157 nm **resist**. The radical copolymn. of 2-trifluoromethylacrylic monomers with norbornene derivs. has been shown to follow the penultimate model much better than the commonly

employed terminal model. These copolymers (contg. >50 mol% TBTFMA) are too lipophilic to provide good imaging. Blending a NBHFA homopolymer with an optical d. (OD) of $1.7/\mu\text{m}$ at 157 nm into the copolymers (OD = $2.5\text{--}2.7/\mu\text{m}$) results in increased hydrophilicity and reduced OD ($2.2\text{--}2.0/\mu\text{m}$) and provides high resoln. images. A copolymer of TBTFMA with vinyl ethers has been identified as a new platform, which can be prepd. facilely by common radical polymn. Certain vinyl ether copolymers are also compatible with the NBHFA homopolymer and thus blending improves their OD and aq. base development. Because these fluoropolymers are highly transparent at 193 nm as well, they are evaluated as 157/193 dual wavelength **resists**.

IT 357397-07-0, α,α -Bis-(trifluoromethyl)-
bicyclo[2.2.1]hept-5-ene-2-ethanol homopolymer
(design and lithog. evaluation of **photoresist**
formulations for 157/193 nm lithog. contg. blends of
fluoropolymers)
RN 357397-07-0 HCAPLUS
CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, α,α -
bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1
CMF C11 H12 F6 O



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and
Other Reprographic Processes)
Section cross-reference(s): 35
ST fluoropolymer vacuum UV **photoresist** radical polymn model
IT Polymer blends
(design and lithog. evaluation of **photoresist**
formulations for 157/193 nm lithog. contg. blends of
fluoropolymers)
IT Dissolution
Dissolution rate
(design and lithog. evaluation of **photoresist**
formulations for 157/193 nm lithog. contg. copolymers of
trifluoromethylacrylic monomers with vinyl ethers)

- IT Fluoropolymers, properties
(design and lithog. evaluation of **photoresist** formulations for 157/193 nm lithog. contg. copolymers of trifluoromethylacrylic monomers with vinyl ethers)
- IT **Photoresists**
(vacuum-UV, chem. amplified; design and lithog. evaluation of **photoresist** formulations for 157/193 nm lithog. contg. copolymers of trifluoromethylacrylic monomers with vinyl ethers)
- IT **357397-07-0, α,α -Bis-(trifluoromethyl)-bicyclo[2.2.1]hept-5-ene-2-ethanol homopolymer**
(design and lithog. evaluation of **photoresist** formulations for 157/193 nm lithog. contg. blends of fluoropolymers)
- IT 370866-39-0 478548-62-8 478623-10-8 478623-11-9
(design and lithog. evaluation of **photoresist** formulations for 157/193 nm lithog. contg. copolymers of trifluoromethylacrylic monomers with norbornene derivs.)
- IT 478623-12-0 478623-13-1 478623-14-2 478623-15-3 478623-16-4
(design and lithog. evaluation of **photoresist** formulations for 157/193 nm lithog. contg. copolymers of trifluoromethylacrylic monomers with vinyl ethers)
- IT 75-59-2, Tetramethylammonium hydroxide
(developer; design and lithog. evaluation of **photoresist** formulations for 157/193 nm lithog. contg. blends of fluoropolymers)
- IT 213740-80-8, Di-4-tert-butyl diphenyliodonium perfluorooctanesulfonate
(photoacid generator; design and lithog. evaluation of **photoresist** formulations for 157/193 nm lithog. contg. blends of fluoropolymers)
- L40 ANSWER 24 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
2002:515153 Document No. 137:224025 Metal-catalyzed vinyl addition polymers for 157 nm **resist** applications. 2. Fluorinated norbornenes: Synthesis, polymerization, and initial imaging results. Tran, Hoang V.; Hung, Raymond J.; Chiba, Takashi; Yamada, Shintaro; Mrozek, Thomas; Hsieh, Yu-Tsai; Chambers, Charles R.; Osborn, Brian P.; Trinque, Brian C.; Pinnow, Matthew J.; MacDonald, Scott A.; Willson, C. Grant; Sanders, Daniel P.; Connor, Eric F.; Grubbs, Robert H.; Conley, Will (Departments of Chemistry and Chemical Engineering, University of Texas, Austin, TX, 78712, USA). Macromolecules, 35(17), 6539-6549 (English) 2002. CODEN: MAMOBX. ISSN: 0024-9297. Publisher: American Chemical Society.
- AB Three metal-catalyzed vinyl addn. copolymers derived from partially fluorinated norbornenes and tricyclononenes have been synthesized and evaluated for use in formulating **photoresists** for 157 nm lithog. imaging. The transparency of these polymers at 157 nm, as measured by variable angle spectroscopic ellipsometry (VASE), is

greatly improved over their nonfluorinated counterparts. The results of preliminary lithog. evaluations of **resists** formulated from these polymers alone and with the addn. of several new fluorinated dissoln. inhibitors are presented. Images as small as 70 nm have been printed in some formulations.

IT **357397-07-0P**

(in synthesis of vinyl addn. copolymers of partially fluorinated norbornenes and matrix for dissoln. rate of fluorinated dissoln. inhibitors)

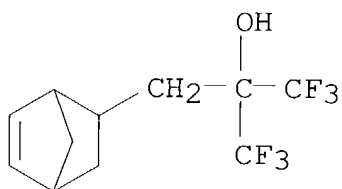
RN 357397-07-0 HCAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, α,α -bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1

CMF C11 H12 F6 O



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 35

ST fluorinated norbornene tricyclononene polymer **photoresist**
vacuum UV lithog

IT UV and visible spectra

(absorption; **photoresists** for 157 nm lithog. based on metal-catalyzed vinyl addn. copolymers of partially fluorinated norbornenes and fluorinated dissoln. inhibitors)

IT **Photoresists**

(chem. amplified; **photoresists** for 157 nm lithog. based on metal-catalyzed vinyl addn. copolymers of partially fluorinated norbornenes and fluorinated dissoln. inhibitors)

IT Absorption spectra

(**photoresists** for 157 nm lithog. based on metal-catalyzed vinyl addn. copolymers of partially fluorinated norbornenes and fluorinated dissoln. inhibitors)

IT Ellipsometry

(spectroscopic, variable-angle; **photoresists** for 157 nm lithog. based on metal-catalyzed vinyl addn. copolymers of partially fluorinated norbornenes and fluorinated dissoln.)

- inhibitors)
- IT Dissolution
Dissolution rate
(testing of dissoln. inhibitors for 157 nm lithog.
photoresists based on vinyl addn. copolymers of partially
fluorinated norbornenes and tricyclononenes)
- IT Polymerization
(vinyl addn.; metal-catalyzed prepn. of vinyl addn. copolymers of
partially fluorinated norbornenes for 157 nm **resist**
applications)
- IT 2052-49-5, Tetrabutylammonium hydroxide
(acid diffusion control; **photoresists** for 157 nm
lithog. based on metal-catalyzed vinyl addn. copolymers of
partially fluorinated norbornenes and fluorinated dissoln.
inhibitors)
- IT 301532-99-0, AR19
(antireflective layer; **photoresists** for 157 nm lithog.
based on metal-catalyzed vinyl addn. copolymers of partially
fluorinated norbornenes and fluorinated dissoln. inhibitors)
- IT 75-59-2, Tetramethylammonium hydroxide
(developer; **photoresists** for 157 nm lithog. based on
metal-catalyzed vinyl addn. copolymers of partially fluorinated
norbornenes and fluorinated dissoln. inhibitors)
- IT 367524-27-4P 370099-18-6P 370099-19-7P
(dissoln. inhibitor; **photoresists** for 157 nm lithog.
based on vinyl addn. copolymers of partially fluorinated
norbornenes and contg. fluorinated carbon monoxide polymers as
dissoln. inhibitors)
- IT 121088-09-3 457096-61-6
(dissoln. inhibitor; testing of dissoln. inhibitors for 157 nm
lithog. **photoresists** based on vinyl addn. copolymers of
partially fluorinated norbornenes and tricyclononenes)
- IT **357397-07-0P**
(in synthesis of vinyl addn. copolymers of partially fluorinated
norbornenes and matrix for dissoln. rate of fluorinated dissoln.
inhibitors)
- IT 12012-95-2, Allyl palladium chloride
(metal-catalyzed prepn. of vinyl addn. copolymers of partially
fluorinated norbornenes for 157 nm **resist** applications)
- IT 170283-35-9P
(metal-catalyzed vinyl addn. copolymers of partially fluorinated
norbornenes and their prepn. and characterization as
photoresists for 157 nm lithog.)
- IT 370099-14-2P 457096-57-0P 457602-53-8DP, reaction products with
di-tert-Bu dicarbonate
(metal-catalyzed vinyl addn. copolymers of partially fluorinated
norbornenes and their prepn. and characterization as
photoresists for 157 nm lithog.)

- IT 144317-44-2, Triphenylsulfonium nonaflate
(photoacid generator; **photoresists** for 157 nm lithog.
based on metal-catalyzed vinyl addn. copolymers of partially
fluorinated norbornenes and fluorinated dissoln. inhibitors)
- IT 302580-86-5P
(**photoresists** for 157 nm lithog. based on vinyl addn.
copolymers of partially fluorinated norbornenes)
- IT 457096-62-7
(synthesis of model tricyclononene monomers for vacuum-UV
photoresist applications)
- IT 370099-16-4P
(synthesis of model tricyclononene monomers for vacuum-UV
photoresist applications)

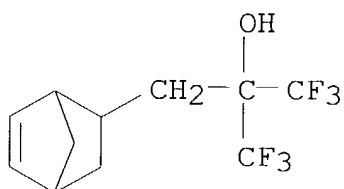
L40 ANSWER 27 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
2001:636379 Document No. 135:218727 **Resist** materials for
157-nm lithography. Fedynyshyn, Theodore H. (Massachusetts
Institute of Technology, Inc., USA). PCT Int. Appl. WO 2001063362
A2 **20010830**, 43 pp. DESIGNATED STATES: W: CA, JP; RW:
AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT,
SE, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2001-US5907
20010226. PRIORITY: US 2000-513792 20000225.

AB The invention relates to **photoresist** materials useful in
microlithog. and to improved materials and methods for pattern
formation on semiconductor wafers. A radiation sensitive resin
compn. including a photo-acid generator and an aliph. polymer having
≥1 electron withdrawing groups adjacent to or attached to a C
atom bearing a protected hydroxyl group, wherein the protecting
group is labile in the presence of in situ generated acid is
described. The radiation sensitive resin compn. can be used as a
resist suitable for image transfer by plasma etching and
enable 1 to obtain an etching image having high precision with high
reproducibility with a high degree of resoln. and selectivity.

- IT **357397-07-0D**, functional-group protected
(pos. **photoresist** compn. for 157-nm lithog. using)
- RN 357397-07-0 HCAPLUS
- CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, α,α -
bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1
CMF C11 H12 F6 O



IC ICM G03F007-00
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and
Other Reprographic Processes)
ST **resist** 157 nm lithog
IT Lithography
 Photoresists
 (pos. **photoresist** compn. for 157-nm lithog. using)
IT 25211-99-8D, functional-group protected 25568-84-7D,
Cyclopentadiene homopolymer, reaction products with
hexafluoroacetone, functional-group protected 219552-58-6D,
functional-group protected 357397-03-6 357397-04-7D,
functional-group protected 357397-05-8D, functional-group
protected 357397-06-9D, functional-group protected
357397-07-0D, functional-group protected 357397-08-1D,
functional-group protected 357397-09-2D, functional-group
protected 357397-11-6D, functional-group protected 357397-12-7D,
functional-group protected
 (pos. **photoresist** compn. for 157-nm lithog. using)